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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/800,749

03/16/2004

Takashi Saiki

042193

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38834

7590

08/23/2006

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EXAMINER

HOANG, QUOC DINH

ART UNIT

PAPER NUMBER

2818

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/800,749	Applicant(s) SAIKI ET AL.	
	Examiner Quoc D. Hoang	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/02/2006 has been entered.

Response to Amendment

2. Amendment filed on 08/02/2006 has been entered. Claim 14 is newly added. Claims 1-5 and 14 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-5, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat No. 6,207,519 hereinafter "Kim").

Regarding claim 1, Kim teaches a semiconductor device comprising:

a gate (106) formed over a semiconductor region (100) while placing an insulating film (104) in between (col. 2, lines 50-67 Fig. 9);

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a first impurity-diffused region (110) formed , as being substantially aligned with said gate in the surficial layer of the semiconductor region, (col. 2, lines 1-65 and Fig. 9);

a second impurity-diffused region (114) formed, as being distant from said gate while placing a portion of a side of said first impurity-diffused region in between (col. 4, lines 1-15 and Fig. 9); and

a third impurity-diffused region (118) formed as being distant from said gate while placing said portion of said side of said first impurity-diffused region and a portion of a side of said second impurity-diffused region in between, (col. 4, lines 15-23 and Fig. 9); wherein the third impurity-diffused region (118) has a higher impurity-concentration than the second impurity-diffused region (114) (col. 4, lines 1-23) ; and wherein said second impurity-diffused region (114) is formed as containing a diffusion suppressive element (boron) (col. 4, line 4). *Noted that boron in Kim is considered to be the diffusion suppressive element.* Kim teaches the diffusion suppressive element except for “for suppressing diffusion of an impurity contained in said third impurity-diffused region”. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to combine the second impurity-diffused region containing a diffusion suppressive element teaching of Kim with “diffusion suppressive element for suppressing diffusion of an impurity contained in said third impurity-diffused region”, since it has been held that the recitation of a new intended use for an old product does not make a claim to that old product patentable, *In re Schreiber* 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding claim 2, Kim teaches further comprising:

a first sidewall spacer (112) formed over both lateral faces of said gate (col. 2, lines 50-67 and Fig. 9); and

a second sidewall spacer (116) formed to cover said first sidewall spacer 16 over both lateral sides of said gate (col. 2, lines 50-67 and Fig. 9); wherein said second impurity-diffused region is formed as being aligned with said first sidewall spacer, and said third impurity-diffused region is formed as being aligned with said second sidewall spacer (col. 2, lines 50-67 and Fig. 9).

Regarding claim 14, Kim teaches wherein the third impurity-diffused region (118) has a higher impurity-concentration than the first impurity-diffused region (110) (col. 3, lines 58-64 and col. 4, lines 15-23).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat No. 6,207,519 hereinafter "Kim") in view of Kim et al., (US Pat No. 6,275,906, hereinafter "Kim").

Regarding claim 3, Kim does not teach the fourth impurity-diffused region containing an impurity having a conductivity type opposite to that of impurities contained in the first and third impurity-diffused regions.

However, Kim ('906) teaches the fourth impurity-diffused region (26) containing an impurity having a conductivity type (p-type) opposite to that of impurities contained in said first impurity-diffused region (n-type) (22) and third impurity-diffused region (n-type) (28) (col. 3, lines 10-45 and Fig. 1). Since Kim and Kim ('906) recognized in the pertinent art of Kim. It would have been obvious to a person of ordinary skill in the art at

the time of the invention was made to provide the fourth impurity-diffused region containing an impurity having a conductivity type opposite to that of impurities contained in said first and third impurity-diffused regions in order to enclose the first impurity-diffused region and prevent the impurity from being inwardly extending beyond the first impurity-diffused region as taught by Kim ('906), column 5, lines 1-18.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat No. 6,207,519 hereinafter "Kim") in view of Cheng et al (US Pub No. 2004/0266122, hereinafter "Cheng").

Regarding claim 4, Kim the diffusion suppressive element (boron), but does not teach wherein said diffusion suppressive element is at least any one element selected from arsenic, germanium, nitrogen, fluorine and carbon for the case where said impurity contained in said first and third impurity-diffused regions is an n-type impurity.

However, Cheng teaches wherein said diffusion suppressive element in second impurity-diffused region (18) is arsenic for the case where said impurity contained in said first impurity-diffused region (8) and third impurity-diffused region (24) is an n-type impurity ([0025], Fig. 3 and Fig. 5). Since Kim and Cheng recognized in the pertinent art of Kim. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide arsenic in the in second impurity-diffused region in order to obtain the same dopant with the first and third impurity-diffused regions as taught by Chang, [0025].

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al (U.S. Pat No. 6,207,519 hereinafter "Kim") in view of Hayashida et al., (US Pat No. 5,6903,029, hereinafter "Hayashida").

Regarding claim 5, Kim teaches wherein the diffusion suppressive element is boron (col. 4, line 4), but does not teach wherein the diffusion suppressive is at least any one element selected from germanium, nitrogen, fluorine, carbon and indium for the case where said impurity contained in said first and third impurity-diffused regions is an p-type impurity.

However, Hayashida teaches an impurity to be implanted to form the high concentration region (9b) is not limited to boron, but a different impurity having the same conductivity type (p-type) as that of boron, such as indium may also be used for the case where said impurity contained in said first impurity-diffused region (7) and third impurity-diffused region (9a) is an p-type impurity (col. 5, line 64 through col. 6, line 11 and Fig. 1). Since Kim and Hayashida are all from the same field of endeavor, the purpose disclosed by Hayashida would have been recognized in the pertinent art of Kim. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide the indium as an p-type impurity instead of boron in order to easy to control the impurity concentration profile, since indium, in compared to boron, has a larger atomic weight, a smaller implantation range and a smaller diffusion coefficient as taught by Hayashida, column 6, lines 1-11.

Conclusion

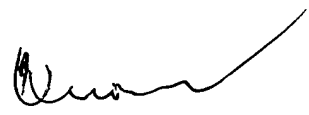
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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quoc Hoang whose telephone number is (571) 272-1780. The examiner can normally be reached on Monday-Friday from 8.00 AM to 5.00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MinSun Harvey can be reached on (571) 272-1835. The fax phone numbers of the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Quoc Hoang
Patent examiner/AU 2818


08/10/2006